

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 15 February 2001 (15.02.01)	
International application No. PCT/IE00/00084	Applicant's or agent's file reference PE1120
International filing date (day/month/year) 05 July 2000 (05.07.00)	Priority date (day/month/year) 06 July 1999 (06.07.99)
Applicant FRITSCH, Joseph, Frederick et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 11 January 2001 (11.01.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Authorized officer

Pascal Piriou

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PE1120	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/IE 00/ 00084	International filing date (day/month/year) 05/07/2000	(Earliest) Priority Date (day/month/year) 06/07/1999
Applicant FRITSCH, Joseph Frederick		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PC 00/00084

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G11B7/12 G11B33/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 088 083 A (NORMAN J. OLSON) 11 February 1992 (1992-02-11)	1-15
Y	column 3, line 26 -column 4, line 13; figures 1-4	16, 17
X	DE 198 33 577 A (TDK CORP) 4 February 1999 (1999-02-04) column 3, line 32 -column 4, line 12 column 7, line 20 - line 39; figure 4	1-3
X	GB 2 306 759 A (TDK CORPORATION) 7 May 1997 (1997-05-07) page 23, line 14 -page 25, line 36; figures 13-17	1, 3, 35-38, 41-44
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

13 October 2000

Date of mailing of the international search report

24/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Chaumeron, B

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/00084

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 01, 29 January 1999 (1999-01-29) & JP 10 275440 A (KYUSHU HITACHI MAXELL LTD), 13 October 1998 (1998-10-13) abstract ----	16, 17
X	PATENT ABSTRACTS OF JAPAN vol. 0123, no. 96, 21 October 1988 (1988-10-21) & JP 63 136371 A (SONY CORP), 6 August 1988 (1988-08-06) abstract ----	41, 45
X	WO 95 24039 A (ROBERT D. MARTIN) 8 September 1995 (1995-09-08) page 3, line 5 -page 4, line 30; figures 1-4 ----	1
X	WO 98 53455 A (DIGITAL PAPYRUS CORPORATION) 26 November 1998 (1998-11-26) page 2, line 10 - line 21; figures 1,2 ----	1
X	DE 39 25 902 A (HITACHI LTD) 22 March 1990 (1990-03-22) column 8, line 47 -column 9, line 6; figure 7 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PO 00/00084

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5088083	A	11-02-1992	NONE		
DE 19833577	A	04-02-1999	JP 11045417	A	16-02-1999
GB 2306759	A	07-05-1997	JP 2819492	B	30-10-1998
			JP 7006431	A	10-01-1995
			JP 7033185	A	03-02-1995
			JP 7169030	A	04-07-1995
			JP 2899940	B	02-06-1999
			JP 7169081	A	04-07-1995
			GB 2312084	A, B	15-10-1997
			DE 4419477	A	08-12-1994
			GB 2278710	A, B	07-12-1994
			US 5966360	A	12-10-1999
JP 10275440	A	13-10-1998	NONE		
JP 63136371	A	08-06-1988	JP 8034008	B	29-03-1996
WO 9524039	A	08-09-1995	AU 6587494	A	18-09-1995
			EP 0748505	A	18-12-1996
WO 9853455	A	26-11-1998	NONE		
DE 3925902	A	22-03-1990	JP 2168481	A	28-06-1990

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REC'D 12 OCT 2001

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PE1120		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IE00/00084	International filing date (day/month/year) 05/07/2000	Priority date (day/month/year) 06/07/1999	
International Patent Classification (IPC) or national classification and IPC G11B7/12			
Applicant FRITSCH, Joseph Frederick et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 11/01/2001	Date of completion of this report 10.10.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Chaumeron, B Telephone No. +49 89 2399 2662 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IE00/00084

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-18 as originally filed

Claims, No.:

1-47 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IE00/00084

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-15,35-38,41-47
Inventive step (IS)	Yes: Claims	
	No: Claims	16-34,39,40
Industrial applicability (IA)	Yes: Claims	1-47
	No: Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IE00/00084

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.) Reference is made to the following documents:

D1: US-A-5088083
D2: DE-A-19833577
D3: GB-A-2036759
D4: JP-A-10275440
D5: JP-A-63136371

2.) The subject-matter of claim 1 is anticipated by the disclosure of D1; for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D1:

Protective device (13) for protecting an interface means (11) of a read/write unit ('compact disc playing machine') ,
the read and /or write unit comprising:
a receiving area (14) for receiving a data carrier,
the interface means (11) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (see figure 1);
wherein the protective device comprises:
a data carrier (32) for engaging in the receiving area of the read and/or write unit, and a protecting means (33) carried on the carrier means for engaging the interface means (11) when the carrier means is engaged in the receiving area.

3.) The subject-matter of claim 1 is anticipated by the disclosure of D2, for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D2 (reference is made to figure 4 of D2):

Protective device (3) for protecting an interface means (A) of a read/write unit (Mini-disc player) ,

the read and /or write unit comprising:

a receiving area (implicitly disclosed in D2) for receiving a data carrier,

the interface means (A) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (implicitly disclosed in D2);

wherein the protective device comprises:

a data carrier (1) for engaging in the receiving area of the read and/or write unit, and a protecting means (3) carried on the carrier means for engaging the interface means (A) when the carrier means is engaged in the receiving area.

4.) The subject-matter of claim 1 is anticipated by the disclosure of D3, for the following reason:

the 6th embodiment disclosed in D3 (see D3, page 23 to page 24, 6th line from bottom; figures 13 to 17) anticipates the subject-matter of claim 1.

5.) The subject-matter of claim 1 is anticipated by the disclosure of D4 (see figure 1 and text of the English abstract).

6.) The additional feature of claim 2 is known from D2 (column 3, lines 61 to 65), or D3 (see D3, page 24, 6th to 10th lines from bottom).

7.) The additional feature to claim 3 is known from all the documents D1 to D4.

8.) The additional feature of claim 4 is known from D1 (see figure 4).

9.) The additional feature of claim 5 is known from D3 (see figure 14).

10.) The additional feature of claim 6 is known from D1.

11.) The additional features of claims 7 to 15 are known from D1.

12.) The subject-matter of claim 16 lacks an inventive step with respect to the combination of D1 and D4; for the following reasons:

the features of claims 1,8 and 15 are known from D1. the objective problem corresponding to the additional feature of claim 16 can be formulated as follows:

reducing the forces applied to the lens when the brush comes into contact with the lens.

It appears that this problem is solved by D4 which suggests to give a certain orientation to the brush to avoid: 'a strong impact caused by the contact given to the objective lens' (see abstract of D4). A skilled person interpreting D4 would in an obvious manner consider a wide range as that specified in D4 (20° to 80°). It is noted that no specific reason is given in the description of the application justifying the limits of the claimed range.

Therefore the subject-matter of claim 16 is obvious with respect to the combination of D1 and D4.

13.) The range claimed in claim 17 is not known from the available prior art documents. However a doubt remains as to the presence of an inventive step regarding this range because no reason is given in the description justifying the values specified for the limits of the range.

14.) Claim 35:

The subject-matter of claims 35 to 38 is known from D3.

15.) Claim 41:

The subject-matter of claim 41 is anticipated by D3 (see D3, 6th embodiment, figure 13 to 16, page 23, 4th par. to page 25, bottom of the page; it can be seen from figure 14 that the cleaning member 16 does protect the head (14)), or D5.

16.) Additional features of claims 42 to 44 are known from D3.

17.) The method specified in claim 45 is known from D5 (see D5 abstract which indicates that during the cleaning process the lens is moved by the focusing mechanism i.e. along a vertical axis with respect to the disc plane).

18.) Claim 46:

A cleaning device according to claim 46 is known from D2 (see D2, column 7, lines 20 to 39).

19.) Claim 47:

The subject-matter of method claims 46 or 47 is anticipated by D2 (see D2, column 7, lines 20 to 39).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IE00/00084

20.) Remaining dependent claims:

It appears that all the features of the remaining dependent claims can be found in the documents D1 to D5. No specific feature of the dependent claims which could serve as a basis for new claims could be found.

Re Item VIII

Certain observations on the international application

1.) In the independent claims 1,35,41,46,47, the phrase 'of the type here before' leads to a lack of clarity of each of the claims because it is not clear to which text the claims refer to. The applicant's attention is drawn to the fact that a claim should normally not refer to the description (see PCT Guidelines Section IV part III 4. 10, Rule 6.2 a)).

2.) The plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection. Hence claims do not meet the requirements of Article 6 PCT.

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

WRITTEN OPINION

(PCT Rule 66)

To:

F.F. GORMAN & CO
54 Merrion Square
Dublin 2
IRLANDE

Date of mailing (day/month/year)	14.05.2001
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Applicant's or agent's file reference

PE1120

REPLY DUE

within 3 month(s)
from the above date of mailing

International application No.

PCT/IE00/00084

International filing date (day/month/year)

05/07/2000

Priority date (day/month/year)

06/07/1999

International Patent Classification (IPC) or both national classification and IPC

G11B7/12

Applicant

FRITSCH, Joseph Frederick et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06/11/2001.

D14/8
13/7
14/6

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Chaumeron, B

Formalities officer (incl. extension of time limits)

Slater, S
Telephone No. +49 89 2399 2565



I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

Description, pages:

1-18 as originally filed

Claims, No.:

1-47 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Claims 1-15,35-38,41-47

Inventive step (IS) Claims 16-34,39,40

Industrial applicability (IA) Claims

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.) Reference is made to the following documents:

D1: US-A-5088083
D2: DE-A-19833577
D3: GB-A-2036759
D4: JP-A-10275440
D5: JP-A-63136371

2.) The subject-matter of claim 1 is anticipated by the disclosure of D1; for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D1:

Protective device (13) for protecting an interface means (11) of a read/write unit ('compact disc playing machine') ,
the read and /or write unit comprising:
a receiving area (14) for receiving a data carrier,
the interface means (11) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (see figure 1);
wherein the protective device comprises:
a data carrier (32) for engaging in the receiving area of the read and/or write unit, and a protecting means (33) carried on the carrier means for engaging the interface means (11) when the carrier means is engaged in the receiving area.

3.) The subject-matter of claim 1 is anticipated by the disclosure of D2, for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D2 (reference is made to figure 4 of D2):

Protective device (3) for protecting an interface means (A) of a read/write unit (Mini-disc player) ,

the read and /or write unit comprising:

a receiving area (implicitly disclosed in D2) for receiving a data carrier,
the interface means (A) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (implicitly disclosed in D2);

wherein the protective device comprises:

a data carrier (1) for engaging in the receiving area of the read and/or write unit, and a protecting means (3) carried on the carrier means for engaging the interface means (A) when the carrier means is engaged in the receiving area.

4.) The subject-matter of claim 1 is anticipated by the disclosure of D3, for the following reasons:

the applicant will appreciate that in particular the 6th embodiment disclosed in D3 (see D3, page 23 to page 24, 6th line from bottom; figures 13 to 17) anticipates the subject-matter of claim 1.

5.) The subject-matter of claim 1 is anticipated by the disclosure of D4 (see figure 1 and text of the English abstract).

6.) The additional feature of claim 2 is known from D2 (column 3, lines 61 to 65), or D3 (see D3, page 24, 6th to 10th lines from bottom).

7.) The additional feature to claim 3 is known from all the documents D1 to D4.

8.) The additional feature of claim 4 is known from D1 (see figure 4).

9.) The additional feature of claim 5 is known from D3 (see figure 14).

10.) The additional feature of claim 6 is known from D1.

11.) The additional features of claims 7 to 15 are known from D1.

12.) The subject-matter of claim 16 lacks an inventive step with respect to the combination of D1 and D4; for the following reasons:

the features of claims 1,8 and 15 are known from D1. the objective problem corresponding to the additional feature of claim 16 can be formulated as follows:

reducing the forces applied to the lens when the brush comes into contact with the lens. It appears that this problem is solved by D4 which suggests to give a certain orientation to the brush to avoid: 'a strong impact caused by the contact given to the objective lens' (see abstract of D4). A skilled person interpreting D4 would in an obvious manner consider a wide range as that specified in D4 (20° to 80°). It is noted that no specific reason is given in the description of the application justifying the limits of the claimed range.

Therefore the subject-matter of claim 18 is obvious with respect to the combination of D1 and D4.

13.) The claimed range is not known from the available prior art documents. However a doubt remains as to the presence of an inventive step regarding this range because no reason is given in the description justifying the values specified for the limits of the range. If this feature is included in a future amended claim, then some arguments should be put forward by the applicant showing the presence of an inventive step.

14.) Claim 35:

The subject-matter of claims 35 to 38 is known from D3.

15.) Claim 41:

The subject-matter of claim 41 is anticipated by D3 (see D3, 6th embodiment, figure 13 to 16, page 23, 4th par. to page 25, bottom of the page; it can be seen from figure 14 that the cleaning member 16 does protect the head (14)), or D5

16.) Additional features of claims 42 to 44 are known from D3.

17.) The method specified in claim 45 is known from D5 (see D5 abstract which indicates that during the cleaning process the lens is moved by the focusing mechanism i.e. along a vertical axis with respect to the disc plane).

18.) Claim 46:

A cleaning device according to claim 46 is known from D2 (see D2, column 7, lines 20 to 39).

19.) Claim 47:

The subject-matter of method claims 46 or 47 is anticipated by D2 (see D2, column 7, lines 20 to 39).

20.) Remaining dependent claims:

It appears that all the features of the remaining dependent claims can be found in the documents D1 to D5. No specific feature of the dependent claims which could serve as a basis for new claims could be found.

21.) If new claims are filed, it is recommended to follow the following instructions:

- indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art (in particular indicate the objective technical problem solved by the invention specified in the claim) and the significance thereof.
- indicate any argument showing the presence of an inventive step.
- In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34 2) b) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based. If the applicant regards it as appropriate these indications can be submitted in handwritten form on a copy of the relevant parts of the application as filed.
- cite D1 to D5 and briefly indicate the relevant background art disclosed in these documents (Rule 5.1(a)(ii) PCT).
- put the description into conformity with the new claims.

Re Item VIII

Certain observations on the international application

1.) In the independent claims 1,35,41,46,47, the phrase 'of the type here before' leads to a lack of clarity of each of the claims because it is not clear to which text the claims refer to. The applicant's attention is drawn to the fact that a claim should normally not refer to the description (see PCT Guidelines Section IV part III 4. 10, Rule 6.2 a)).

2.) The plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection. Hence claims do not meet the



**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/IE00/00084

requirements of Article 6 PCT. It is suggested to file a single independent claim per category.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 January 2001 (11.01.2001)

PCT

(10) International Publication Number
WO 01/03132 A1

(51) International Patent Classification⁷: G11B 7/12, 33/14

(21) International Application Number: PCT/IE00/00084

(22) International Filing Date: 5 July 2000 (05.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
S990560 6 July 1999 (06.07.1999) IE
S990561 6 July 1999 (06.07.1999) IE

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

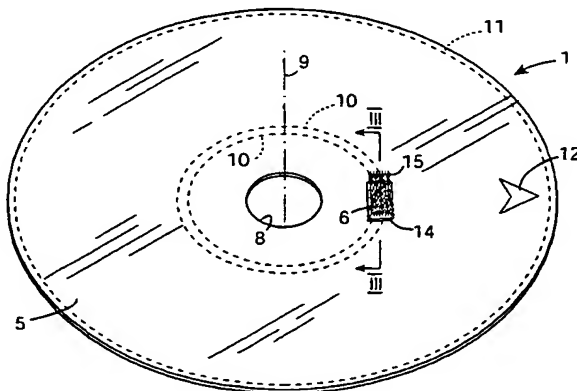
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A PROTECTIVE DEVICE



(57) Abstract: A protective device (1) for protecting an optical head (2) of a disc drive unit against dirt and dust and shock when the disc drive unit is not in use comprises a carrier disc (5) similar to a music CD disc for engaging in the disc receiving area of the disc drive unit. A brush member (6) located on the carrier disc (5) at a position corresponding to the inner data track (10) of a music CD disc is provided for engaging a lens (3) and a peripheral portion (7) of a lens carrier (4) of the head (2) when the head (2) is in the inactive position for protecting the lens (3) and the peripheral portion (7) against dirt and dust. Fibres (15) of the brush member (6) are of sufficient length to engage and embrace the lens (3) and the peripheral portion (7) of the lens carrier (4) when the head (2) is in the inactive position. The fibres (15) are of sufficient resilience for also protecting the head (2) against shock. The brush member (6) also cleans the lens (3) as the brush member (6) passes by the lens (3) on insertion and ejection of the carrier disc (5) in and from the disc receiving area. Further cleaning can be achieved by activating the disc drive unit for causing the head (2) to go through a number of data focusing cycles for urging the lens (3) into and out of the brush member (6).

"A protective device"

The present invention relates to a protective device, and in particular, to a protective device for protecting an interface means, for example, a read and/or write head or a pin connector of a read and/or write unit of the type in which the interface means is provided for reading and/or writing data to or from a data carrier, such as, for example, a floppy disc, an optical disc, a data cartridge unit or an integrated circuit chip of the type which, for example, stores computer games and the like.

10 In this specification the term read and/or write unit is used to include at least the following within its meaning, an optical disc drive unit, for example, a music compact disc player and/or recorder unit, a CD ROM read and/or write drive unit, a floppy disc drive, a tape drive unit, for example, a magnetic tape drive unit, such as, a tape cassette player and/or recorder unit, or a tape cassette read and/or write unit, a data
15 cartridge tape drive unit, and a read and/or write unit of the type adapted to read and/or write, but in particular to read an integrated chip in which a computer game is stored. The term interface means is used in this specification to mean any type of interface which interfaces with a data carrier in a read and/or write unit for reading from and/or writing to the data carrier. Such interface means would at least include a
20 read and/or write head, which may be a magnetic head or an optical head, or a combination of both. Such interface means would also include a pin and/or socket connector for connecting to a corresponding pin and/or socket connector of an integrated circuit chip of the type on which a computer game is stored. Such read and/or write units typically are provided with a receiving area for receiving the data
25 carrier which may be, for example, a floppy disc, an optical disc, a tape cassette or a data carrier tape cassette, or an integrated circuit chip housed in a housing with a pin and/or socket connector. The interface means, typically is located in or adjacent the receiving area for interfacing with the data carrier for in turn reading and/or writing data to or from the data carrier. Such read and/or write units may be suitable
30 for receiving data carriers on which the data is stored in digital and/or analogue form and may be for music and/or computer data, or otherwise.

Such read and/or write units are well known. As discussed above, the interface

means, typically, a read and/or write head or a pin and/or socket connector are located in or adjacent the receiving area for receiving the data carrier. In general, the read and/or write head of such units, or pin and/or socket connector are relatively fragile components and are easily damaged by, for example, shock and the like.

5 Additionally, if the interface means of such read and/or write units become soiled with dust or dirt, in general they become inoperable. Because of the construction of many such read and/or write units, dust and dirt can readily easily collect on the interface means, and in particular, can collect on the interface means when the read and/or write unit is not in use.

10

While cleaning devices are known for cleaning read and/or write heads of such units when the read and/or write units are operational, there are no protective devices which satisfactorily protect the read and/or write head when the read and/or write unit is not in use. In particular, there are no protective devices which satisfactorily
15 protect the read and/or write head from dust and/or dirt when the read and/or write unit is not in use.

There is therefore a need for a protective device which protects an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore
20 defined from dirt and dust when the read and/or write unit is not in use. It is also desirable, that the protective device should protect the interface means from shock when the read and/or write unit is not in use.

The present invention is directed towards providing such a protective device.

25

According to the invention there is provided a protective device for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means being located in or adjacent the
30 receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, wherein the protective device comprises a carrier means for engaging in the receiving area of the read and/or write unit, and a protecting means carried on the carrier means for engaging the interface means for protecting the

interface means when the carrier means is engaged in the receiving area.

In one embodiment of the invention the protecting means is located on the carrier means at a position which when the carrier means is located in the receiving area coincides with an inoperative position of the interface means, and/or a position at which the interface means expects to find directory or other relevant data on a data carrier.

Preferably, the protecting means engages the interface means with a portion of the interface means nested into the protecting means. Advantageously, the area of the protecting means offered up to the interface means is at least of area similar to the area of the portion of the interface means to be nested into the protecting means. Ideally, the area of the protecting means offered up to the interface means is greater than the area of the portion of the interface means to be nested into the protecting means. Preferably, the area of the protecting means offered up to the interface means is such that the protecting means embraces a peripheral portion extending around the portion of the interface means to be nested into the protecting means.

In one embodiment of the invention the protecting means is resilient.

In another embodiment of the invention the protecting means comprises a plurality of fibres extending from the carrier means for engaging the interface means. Preferably, the fibres of the protecting means are flexible. Advantageously, the fibres of the protective device are resilient. Ideally, the fibres of the protecting means are provided in the form of a brush. Advantageously, the fibres of the protecting means extend from a base member mounted on the carrier means.

In one embodiment of the invention a resilient mounting means is provided for resiliently mounting the base member of the protecting means to the carrier means.

In another embodiment of the invention the carrier means defines a central axis for in use coinciding with a rotational axis of a data carrier in the receiving area.

In a further embodiment of the invention the carrier means defines a carrier plane, and the fibres of the protecting means extend from the carrier means at an angle to the carrier plane of less than 90°. Advantageously, the fibres of the protecting means extend from the carrier means at an angle to the carrier plane in the range of 20° to 80°. Preferably, the fibres of the protecting means extend from the carrier means at an angle to the carrier plane in the range of 50° to 80°. Ideally, the fibres of the protecting means extend from the carrier means in a direction circumferentially relative to the central axis defined by the carrier means.

10 In one embodiment of the invention the protecting means extends circumferentially around the central axis defined by the carrier means.

In another embodiment of the invention the protecting means extends completely around the central axis defined by the carrier means.

15 Ideally, the protecting means is spaced apart from the central axis defined by the carrier means.

In one embodiment of the invention the protecting means protects the interface means from dirt and dust.

In another embodiment of the invention the protecting means protects the interface means from shock.

25 In one embodiment of the invention an indicating means is provided for indicating the direction in which the carrier means is to be inserted in the receiving area of the read and/or write unit. Preferably, the indicating means is provided on the carrier means. Advantageously, the indicating means facilitates alignment of the protecting means with the interface means.

30 In a further embodiment of the invention the protecting means is located on the carrier means for cleaning the interface means as the carrier means is being inserted in the receiving area.

In one embodiment of the invention the protecting means is located on the carrier means for cleaning the interface means when the read/write unit is activated for reading or writing data, and the interface means is being initially moved for
5 identifying data.

In another embodiment of the invention the carrier means is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means is provided for protecting a read and/or write head forming the interface means of the
10 read and/or write unit.

In a further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being initially moved for identifying data.
15

In a still further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means into and out of the protecting means.
20

In a further embodiment of the invention the protecting means is for protecting a read and/or write head provided by an optical head.

In one embodiment of the invention the protecting means is for engaging a lens of
25 the read and/or write optical head. Alternatively, the protecting means is for protecting a read and/or write head provided by a magnetic head.

Additionally, the invention provides a method for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined
30 in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means having a protecting means mounted thereon into the receiving area of the read and/or write unit, and engaging

the protecting means with the interface means when the carrier means is engaged in the receiving area for protecting the interface means.

In one embodiment of the invention the protecting means protects the interface
5 means from dirt and/or dust.

In another embodiment of the invention the protecting means protects the interface means from shock.

10 In a further embodiment of the invention the protecting means cleans the interface means as the carrier means is being inserted into the receiving area.

In a still further embodiment of the invention the protecting means cleans the interface means when the interface means has been activated to identify data, and
15 advantageously, the protecting means cleans the interface means when the interface means is being initially moved perpendicularly relative to the carrier means into and out of the protecting means for identifying data.

The invention further provides a method for protecting an interface means of the type
20 hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means of the protective device according to the invention into the receiving area of the read and/or write unit, and
25 engaging the protecting means with the interface means when the carrier means is inserted in the receiving area for protecting the interface means.

In one embodiment of the invention the read and/or write unit is a disc drive read
and/or write unit, and the interface means is a read and/or write head.

30 In another embodiment of the invention the read and/or write head is an optical head. Alternatively, the read and/or write head is a magnetic head.

In a still further embodiment of the invention the method further comprises activating the read and/or write unit for causing the interface means to cycle perpendicularly relative to a plane defined by the carrier means for cycling the interface means into and out of the protecting means for cleaning the interface means.

5

Additionally, the invention provides a cleaning device for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means being located in or adjacent the
10 receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, wherein the cleaning device comprises a carrier means for engaging in the receiving area of the read and/or write unit, and a cleaning means carried on the carrier means for alignment with the interface means when the carrier means is located in the receiving area so that movement of the interface means when the read
15 and/or write unit is activated for identifying data the interface means is moved into and out of the cleaning means for cleaning the interface means.

Further the invention provides a method for cleaning an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in
20 which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means having a cleaning means mounted thereon into the receiving area of the read and/or write unit with the cleaning means aligned with the interface means when the carrier means is engaged
25 in the receiving area, and activating the read and/or write unit for causing the interface means to move relative into and out of the cleaning means for identifying data for cleaning the interface means.

The advantages of the invention are many. By virtue of the fact that the protecting
30 means engages the interface means of a read and/or write unit when not in use where the protective device is adapted for protecting against dirt and dust the protective device protects the area of the interface means which is engaged by the protecting means against dirt and dust over the entire period while the protective

device is located in the receiving area of the read and/or write unit. Additionally, where the protective device is adapted for protecting the interface means against shock, while the protective device is located in the receiving area of the read and/or write unit the interface means is protected by the protecting means against shock. A further advantage of the invention is achieved when the protecting means is provided with a cleaning action, in that the protective device as well as protecting the interface means against shock and/or dirt and dust also tends to clean the portion of the interface means engaged by the protecting means.

10 The provision of the protecting means in the form of a brush provides a particularly desirable form of the protective device in that as well as protecting against dirt and dust, the protective device also acts to clean the interface means as the protecting means is passed relative to the interface means on being inserted into or ejected from the receiving area of the read and/or write unit. Indeed, by providing the brush

15 of the protecting means with sufficient resilience the protective device has the further advantage of protecting the interface means against shock.

A further advantage of the invention is that it is particularly suitable for cleaning the head, and in particular, an optical head of a disc drive unit where the optical head is particularly dirty. By virtue of the fact that the only relative movement required between the head and the protecting means when the disc drive unit is activated is the movement of the head during its focusing cycles, the disc drive unit may be operated a sufficient number of times until the head has been cleaned. This is a particularly important advantage over and above those cleaning devices in which

20 relative lateral movement, namely, relative radial and circumferential movement between the head and a cleaning means on a carrier means is required, since in many disc drive units the head of the disc drive unit will not move radially from its inactive position until data has been found on the inner data track of a CD ROM or music CD disc, or the like. Additionally, in some disc drive units the CD ROM or

25 music CD will not commence to rotate in the event that the lens of the optical head is so dirty as to prevent any reading of data whatsoever. Essentially the device according to the invention acts as a stationary cleaning device, in other words the device cleans the interface means without movement of the device being required.

30

For example, when the device is adapted for protecting and/or cleaning an optical head of a disc drive unit rotation of the carrier means is not required. Cycling movement of the optical head for focusing the head is sufficient for obtaining cleaning of the optical head and/or the lens of the optical head.

5

The invention will be more clearly understood from the following description of some preferred embodiments thereof which are given by way of example only with reference to the accompanying drawings, in which:

10 Fig. 1 is a perspective view of a protective device according to the invention for protecting an interface means, namely, a read and/or write head of a read and/or write unit, namely, a disc drive unit,

15 Fig. 2 is an enlarged perspective view of a portion of the protective device of Fig. 1,

Fig. 3 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 1 on the line III-III of Fig. 1 illustrated in use,

20 Fig. 4 is a perspective view of a protective device according to another embodiment of the invention for protecting a read write head of a read write unit,

25 Fig. 5 is an enlarged perspective view of a portion of the protective device of Fig. 4,

Fig. 6 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 4 on the line VI-VI of Fig. 4 illustrated in use,

30 Fig. 7 is a perspective view of a protective device according to a further embodiment of the invention for protecting a read/write head of a read and/or write unit, and

Fig. 8 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 7 on the line VIII-VIII of Fig. 7 illustrated in use.

Referring to the drawings and initially to Figs. 1 to 3, there is illustrated a protective
5 device according to the invention indicated generally by the reference numeral 1 for
protecting an interface means, in this embodiment of the invention a read and/or
write optical head 2 of a read and/or write unit, namely, a music CD disc drive unit
(not shown) such as a music compact disc player and/or recorder unit. The
protective device 1 protects a lens 3 in a lens carrier 4 of the head 2 from dust and
10 dirt, and also protects the head 2 from shock when the disc drive unit is not in use.
Only the lens 3 and a portion of the lens carrier 4 of the head 2 are illustrated
schematically in Fig. 3. The protective device 1 also acts as a cleaning device for
cleaning the lens 3 of the read and/or write head 2 as will be described below. The
protective device 1 comprises a carrier means, namely, a carrier disc 5 which is
15 similar in size and shape to a music CD disc for engaging in a disc receiving area
(not shown) of the disc drive unit. A protecting means for protecting the read and/or
write head 2 comprises a brush member 6 for engaging the lens 3 of the read and/or
write head 2 as well as a peripheral portion 7 of the lens carrier 4, which extends
around the lens 3 adjacent the lens 3 for protecting the lens 3 against dust and dirt,
20 and for protecting the head 2 against shock. The brush member 6 is carried on and
secured to the carrier disc 5 by any suitable securing means, in this case, an
adhesive.

The carrier disc 5 is provided with a central opening 8, similar to the central opening
25 of a music CD disc, and defines a central axis 9 which when the carrier disc 5 is
inserted in the disc receiving area of the disc drive unit coincides with the rotational
axis of a music CD disc when similarly inserted in the disc drive unit. The brush
member 6 is located at a position radially spaced apart from the central axis 9 of the
carrier disc 5 which coincides with the inner data track of a music CD disc so that
30 when inserted in the disc receiving area of the disc drive unit the brush member 6
lies on substantially the same radius as the head 2 when the head 2 of the disc drive
unit is in the inactive position. The normal inactive position of an optical head of disc
drive unit is aligned with the position of the inner data track of a music CD disc. The

normal location of the inner data track of a music CD disc is indicated on the carrier disc 5 in Fig. 1 by the broken lines 10. A broken line 11 indicates the outer periphery of the area in which data is written on a music CD disc.

- 5 An indicating means provided by an arrow head 12 is printed or otherwise formed on the carrier disc 5 for indicating the direction in which the carrier disc 5 should be entered in the disc drive unit and how the carrier disc should be aligned with the disc receiving area, so that when the carrier disc 5 is fully inserted in the receiving area of the disc drive unit the brush member 6 is substantially centrally aligned with the head
- 10 2. In this embodiment of the invention the arrow head 12 is located for alignment with a head accommodating slot in a CD disc receiving tray for receiving and carrying the CD disc into the disc receiving area of the disc drive unit. Such disc receiving trays of disc drive units will be well known to those skilled in the art.
- 15 The brush member 6 comprises a base member 14, which in this embodiment of the invention is provided by woven sheet material, into which fibres 15 of the brush member 6 are woven and extend therefrom at an angle α of approximately 80° to the carrier disc 5. The fibres 15 in extending from the carrier member 5 at the angle α of 80° extend in a direction generally circumferentially relative to the central axis 9 for
- 20 causing the fibres 15 to engage the lens 3 with a wiping, scouring action as the brush member 6 passes the lens 3 as the carrier disc 5 is being engaged in the disc receiving area of the disc drive unit for cleaning the lens 3. The fibres 15 are flexible, but are also resilient for resiliently engaging the lens 3 and the peripheral portion 7 of the lens carrier 4 of the head 2. The base member 14, and in turn the brush member
- 25 6 when viewed in plan are of rectangular shape, in this embodiment of the invention 20mm by 10mm. The base member 14 is secured to the carrier disc 5 with the longer dimension, namely, the 20mm sides extending circumferentially relative to the central axis 9 of the carrier disc 5, and the short dimension, namely, the 10mm sides extending radially relative to the central axis 9 of the carrier disc 5. In general, the
- 30 diameter of a lens of a read and/or write optical head 2 is in the order of 5mm to 6mm diameter, and accordingly, the area of the brush member 6 when viewed in plan is considerably greater than the area of the lens 3, similarly, when viewed in plan. The fact that the area of the brush member 6 in plan view is significantly

greater than the area of the lens 3 reduces the need for precise alignment of the brush member 6 with the lens 3. Furthermore, the fact that the brush member 6 is twice the length in a circumferential direction than in a radial direction relative to the central axis 9 of the carrier disc 5 avoids the need for precise circumferential alignment of the brush member 6 with the head 2.

Additionally, the fibres 15 of the brush member 6 are of length so that when the protective device 1 is inserted in the disc receiving area of the read and/or write unit in the direction of the arrow head 12, and when the head 2 is in the inactive position, the fibres 15 of the brush members 6 engage the lens 3, and furthermore, the lens 3 and a peripheral portion 7 of the lens carrier 4 around the lens 3 nests into the brush member 6, as can most clearly be seen in Fig. 3. This nesting effect of the head 2 into the brush member 6 has the dual effect of protecting the lens 3 and the peripheral portion 7 of the head 2 from dust and dirt while the disc drive unit is not in use, and also for protecting the head 2 against shock.

In this embodiment of the invention the fibres 15 of the brush member 6 are formed by picks or tufts, each of which comprises a plurality of texturised filaments of polyamide – 6.6, and filament diameter 2.2 DTEX (“denier”). Typically, each pick or tuft is made up of approximately fifty filaments which are grouped together, and may be twisted together. The brush member 6 comprises one pick or tuft per square millimetre. The texturizing of the filaments is carried out by heating, and provides the filaments, and in turn the picks or tufts of fibres 15 with an inherent resilience which is sufficient for providing adequate shock protection for the head 2 when the head 2 is engaged by the brush member 6. The resilience of the fibres 15 also enhances the cleaning action of the brush member 6 on the lens 3 as the brush member 6 is being wiped past the lens 3 on insertion in the disc receiving area.

The length of the fibres 15 depends on the type of disc drive unit, and the read and/or write head of which is to be protected. However, ideally, the length of the fibres 11 should be such as to allow at least 0.5 to 2mm of projection of the fibres beyond the lens 3, to ensure that the lens 3 and the peripheral portion 7 of the head 2 adjacent the lens 3 are properly nested into the brush member 6.

In use, the protective device 1 is placed on the disc receiving tray of the disc drive unit with the arrow head 12 aligned with the head accommodating slot in the disc receiving tray. The disc drive unit is then activated for drawing the disc receiving tray, and in turn the device 1 into the disc receiving area of the disc drive unit. On the carrier disc 5 being fully drawn into the disc receiving area the brush member 6 is aligned with the head 2 of the disc drive unit when the head 2 is in the inactive position. As the carrier disc 5 is approaching its fully inserted position into the disc receiving area the brush member 6 wipes across the lens 3 of the head 2, and also the brush member 6 wipes the peripheral portion 7 of the lens carrier 4, thereby causing a cleaning action for cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. When the carrier disc 5 is fully inserted in the disc receiving area, the head 2 in its inactive position engages and nests within the brush member 6 so that the lens 3 and the peripheral portion 7 of the lens carrier 4 are embraced by the fibres 15 of the brush member 6 for protecting the lens 3 and the peripheral portion 7 of the lens carrier 4 against dirt and dust, and also for protecting the head 2 against shock.

A further cleaning action may be achieved by operating the disc drive unit when the carrier disc 5 is inserted in the disc receiving area and the brush member 6 is aligned with the head 2. On activation of disc drive unit the head 2 commences to cycle upwardly and downwardly in the directions of the arrows A and B perpendicularly relative to a plane defined by the carrier disc 5, and this upward and downward cycling movement of the head 2 causes the lens 3 and the peripheral portion 7 of the lens carrier 4 to be urged repeatedly inwardly into and outwardly from the brush member 6. This in and out cycling movement of the head 2 into and out of the brush member 6 causes the fibres 15 to wipe the lens 3 and the peripheral portion 7 of the lens carrier 4, thereby further cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. This inward and outward cycling movement of the head 2 is undertaken by the disc drive unit when the disc drive unit is powered up for causing the head 2 to focus on the data on the inner data track. By virtue of the fact that the brush member 6 is in engagement with the head 2 the head 2 fails to identify data and continues to cycle inwardly and outwardly of the brush member 6 a number

of times in an attempt to focus on data. However, after a number of repeated inward and outward cycles of the head 2 into and out of the brush member 6 the disc drive unit shuts down. This part of the operation of a disc drive unit will be well known to those skilled in the art.

5

Typically, the cycling of the head 2 into and out of the brush member 6 for focusing the head 2 continues for a number of focusing cycles. The number of focusing cycles depends on the particular type of disc drive unit. However, in general, the read and/or write head of a music CD disc drive unit would cycle into and out of the cleaning brush for at least four cycles, and in many cases more than four cycles. In general, four focusing cycles of the head 2 into and out of the brush member 6 is sufficient for cleaning a moderately dusty lens. However, if the lens is heavily soiled, the disc drive may be activated a number of times so that each time the disc drive unit is activated the lens will cycle for the appropriate number of focusing cycles into and out of the brush member 6.

15

Additionally, in certain cases if desired a cleaning fluid which preferably, is a relatively volatile fluid may be applied to brush member 6 for further enhancing the cleaning action of the brush member 6.

20

Typically, when the disc drive unit is not in use the protective device 1 is inserted into the disc receiving area for protecting the head of the disc drive unit. When it is desired to use the disc drive unit, the disc drive unit is operated for ejecting the protective device 1. However, in general, it is desirable that the disc drive unit should be activated when the protective device 1 is inserted for cleaning the lens, and may also be activated prior to ejection of the protective device 1 for also cleaning the head.

25

Referring now to Figs. 4 to 6 there is illustrated a protective device according to another embodiment of the invention indicated generally by the reference numeral 20 also for protecting a lens 3 and a read and/or write head 2 of a music CD disc drive unit. The protective device 20 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main

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difference between the protective device 20 and the protective device 1 is that instead of the brush member 6 being mounted directly onto the carrier disc 5, the brush member 6 is carried on a resilient mounting means, namely, a resilient carrier arm 21 of plastics material which is secured to the carrier disc 5 by adhesive. The carrier arm 21 is secured to a rear surface 22 of the carrier disc 5, and an circular opening 23 is provided in the carrier disc 5 for accommodating the fibres 15 of the brush member 6 therethrough. Additionally, in this embodiment of the invention the brush member 6 instead of being of rectangular shape in plan view is of circular shape. The provision of the carrier arm 21 of a resilient material, further enhances the resilient action of the brush member 6 on the head 2 for enhancing protection of the head 2 against shock.

Otherwise, the protective device 20 is similar to the protective device 1 and its use is likewise similar.

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Referring now to Figs. 7 and 8 there is illustrated a protective device according to a further embodiment of the invention indicated generally by the reference numeral 30 also for protecting a lens 3 and a read and/or write head 2 of a read and/or write music CD disc drive unit. The protective device 30 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main difference between the protective device 30 and the protective device 1 is that the brush member 6 instead of being provided in a rectangular or circular shape is provided in the form of an annular ring 31 which extends circumferentially around and concentrically with the central axis 9 of the carrier disc 5, and coincides with the inner data track of a music CD disc. The advantage of providing the brush member 6 to extend in the form of the annular ring 31 avoids any danger of misalignment of the brush member with the head 2.

In this embodiment of the invention the fibres 15 extend from the base member 14 at an angle α of approximately 80° in a general direction circumferentially relative to the central axis 9 in similar fashion as the fibres 15 extend from the base member 14 of the brush 6 of the protective device 1.

Otherwise, the protective disc 30 is similar to the protective disc 1, and its operation is likewise similar.

While the protective devices have been described for protecting the read and/or write head against both shock and dust and dirt, it is envisaged that in certain cases the protective devices may be provided for protecting against one or the other, in other words, for protecting the head against either shock or dust and dirt. Additionally, while the protective device according to the invention has been described as also having a cleaning action, while this is preferable, it is not essential.

While the brush members have been described as being surface mounted directly onto the carrier disc of the protective devices 1 and 30 of Figs. 1 to 3 and 7 and 8, it is envisaged that the base members of the brush members may be recess mounted into recesses in the carrier disc. Additionally, it is envisaged that the brush members may be mounted onto the carrier disc on resilient blocks.

While it is desirable, it will be appreciated that it is not essential that the carrier means should be similar in shape and size to a data carrier of the type used with the read and/or write unit, the carrier means may be of any desired or suitable shape.

Additionally, it will be appreciated that the central opening in the carrier means may be of any desired or suitable size, and need not necessarily be of size similar to that of a central opening of a data carrier of the type used with the read and/or write unit. Indeed, in certain cases it may be desirable that the central opening should be of diameter greater than that of a normal central opening of the appropriate data carrier. Indeed, in the case of a DVD read and/or write unit in order to avoid the carrier disc rotating, it may be desirable to provide the central opening in the carrier disc of diameter greater than the diameter of a central opening of a DVD for avoiding engagement of the DVD drive with the carrier disc.

Needless to say, it is envisaged that in certain cases, the protective device may be required for protecting an optical head of a disc drive unit in which the optical head is provided with more than one lens, for example, a pair of adjacent lenses, in such cases, it will be appreciated that the area of the protecting means will be such as to

cover the part of the head which is to be protected and to cover the two or more lenses.

While the protective device according to the invention has been described for
5 protecting a read/write head of a music CD disc drive unit from shock, dust and dirt,
and also for cleaning the read and/or write head of a music CD disc drive unit, it is
envisaged that the protective device may be used for protecting and/or cleaning the
head or indeed any other interface means for interfacing with a data carrier of any
other read and/or write unit. For example, the protective device may be used for
10 protecting and/or cleaning the read and/or write head of any of the following read
and/or write units, CD ROM read and/or write units, digital video disc (DVD) player
and/or recorder units, CD interactive drive units, Zip drive units, Jazz drive units,
super disc drive units, floppy disc drive units, mini disc drive units, digital
camcorders, digital cameras, audio tape drive units, data cartridge drive units, and
15 any other read and/or write units. Where the protective device is adapted for
protecting and/or cleaning the interface means of any of these read and/or write
units, preferably an appropriate sized and shaped carrier mean will be provided for
engaging in the data carrier receiving area of the read and/or write unit. Needless to
say, the brush member will also be appropriately sized, shaped and located for
20 engaging the portion of the interface means to be protected and nested into the
brush member.

The protective device according to the invention may also be adapted for protecting
a multi pin plug or socket connector in a data carrier receiving area of a read write
25 unit of the type for receiving a data carrier cassette in which the data is stored on an
integrated chip. In which case it is preferable that the carrier means would be of a
shape and size corresponding to the data carrier cassette and the protecting means
would be mounted on the carrier means at an appropriate location for engaging the
multi pin connector.

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It will of course be appreciated that any other suitable protecting means may be
provided besides a brush member for protecting the read/write head and/or other
interface means from shock, dust and dirt. An advantage of providing the protecting

means by way of a brush member is that the protective device as well as acting as a protective device also acts as a cleaning device for cleaning the lens and/or any other component of the interface means of the read and/or write unit. However, where it is desired to provide the protective device as a protective device for

5 protecting the interface means against dirt and dust only, the resilience of the fibres of the brush member, or its resilient mounting is not as important as when it is desired that the protective device should protect the interface means against shock. The more shock protection which is required, the more resilient should be the fibres of the brush member, and/or the more resilient should be the mounting of the brush

10 member on the carrier disc. Additionally, where it is desired to provide the protective device as a protective device against shock only, the size and area of the protecting means and in particular, its area relative to the interface means is not particularly critical, provided that its shape and area are sufficient for engaging the interface means for protecting against shock. However, where the protective device is to

15 protect against dust and dirt, it is important that the area of the protecting means offered up to the interface means should be such as to at least cover the area of the interface means to be protected against dust and dirt.

While the fibres of the brush member have been described as comprising a plurality

20 of texturised filaments, it is envisaged that the fibres may be formed in other ways and when formed by filaments, it is not essential that the filaments be texturised.

While the indicating means has been described as being provided by an arrow head, any other suitable indicating means for indicating how the device is to be entered in

25 the disc receiving area may be provided in disc drive units where a CD disc is entered manually into a slot and is then subsequently drawn through the slot by the disc drive unit into the disc receiving area, it is envisaged that the indicating means may be provided by an arrow head, which would indicate the portion of the carrier disc to be initially entered in the slot, and the orientation of the disc relative to the

30 slot. Additionally, in some disc drive units a specific indicating means may not be required due to the fact that the shape of the carrier means may facilitate self-alignment.

Claims

1. A protective device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the protective device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a protecting means (6) carried on the carrier means (5) for engaging the interface means (2,3) for protecting the interface means (2,3) when the carrier means (5) is engaged in the receiving area.
2. A protective device as claimed in Claim 1 characterised in that the protecting means (6) is located on the carrier means (5) at a position which when the carrier means (5) is located in the receiving area coincides with an inoperative position of the interface means (2,3), and/or a position at which the interface means expects to find directory and/or other data on a data carrier.
3. A protective device as claimed in Claim 1 or 2 characterised in that the protecting means (6) engages the interface means (2,3) with a portion of the interface means (3,7) nested into the protecting means (6).
4. A protective device as claimed in Claim 3 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is at least of area similar to the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
5. A protective device as claimed in Claim 3 or 4 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is greater than the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
6. A protective device as claimed in any of Claims 3 to 5 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is such

that the protecting means (6) embraces a peripheral portion (7) extending around the portion (3) of the interface means (2,3) to be nested into the protecting means (6).

7. A protective device as claimed in any preceding claim characterised in that
5 the protecting means (6) is resilient.

8. A protective device as claimed in any preceding claim characterised in that
the protecting means (6) comprises a plurality of fibres (15) extending from the
carrier means (5) for engaging the interface means (2,3).
10

9. A protective device as claimed in Claim 8 characterised in that the fibres (15)
of the protecting means (6) are flexible.

10. A protective device as claimed in Claim 8 or 9 characterised in that the fibres
15 (15) of the protective device (6) are resilient.

11. A protective device as claimed in any of Claims 8 to 10 characterised in that
the fibres (15) of the protecting means (6) are provided in the form of a brush (6).

20 12. A protective device as claimed in any of Claims 8 to 11 characterised in that
the fibres (15) of the protecting means (6) extend from a base member (14) mounted
on the carrier means (5).

13. A protective device as claimed in Claim 12 characterised in that a resilient
25 mounting means (21) is provided for resiliently mounting the base member (14) of
the protecting means (6) to the carrier means (5).

14. A protective device as claimed in any preceding claim characterised in that
the carrier means (5) defines a central axis (9) for in use coinciding with a rotational
30 axis of a data carrier in the receiving area.

15. A protective device as claimed in any of Claims 8 to 14 characterised in that
the carrier means (5) defines a carrier plane, and the fibres (15) of the protecting

means (6) extend from the carrier means (5) at an angle to the carrier plane of less than 90°.

16. A protective device as claimed in Claim 15 characterised in that the fibres
5 (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 20° to 80°.

17. A protective device as claimed in Claim 16 characterised in that the fibres
10 (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 50° to 80°.

18. A protective device as claimed in any of Claims 15 to 17 characterised in that
the fibres (15) of the protecting means (6) extend from the carrier means (5) in a
direction circumferentially relative to the central axis (9) defined by the carrier means
15 (5).

19. A protective device as claimed in any of Claims 14 to 18 characterised in that
the protecting means (6) extends circumferentially around the central axis (9)
defined by the carrier means (5).

20. A protective device as claimed in Claim 19 characterised in that the
protecting means (6) extends completely around the central axis (9) defined by the
carrier means (5).

21. A protective device as claimed in any of Claims 14 to 20 characterised in that
the protecting means (6) is spaced apart from the central axis (9) defined by the
carrier means (5).

22. A protective device as claimed in any preceding claim characterised in that
30 the protecting means (6) protects the interface means (2,3) from dirt and dust.

23. A protective device as claimed in any preceding claim characterised in that
the protecting means (6) protects the interface means (2,3) from shock.

24. A protective device as claimed in any preceding claim characterised in that an indicating means (12) is provided for indicating the direction in which the carrier means (5) is to be inserted in the receiving area of the read and/or write unit.

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25. A protective device as claimed in Claim 24 characterised in that the indicating means (12) is provided on the carrier means (5).

26. A protective device as claimed in Claim 24 or 25 characterised in that the
10 indicating means (12) facilitates alignment of the protecting means (6) with the interface means (2,3).

27. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface
15 means (2,3) as the carrier means (5) is being inserted in the receiving area.

28. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) when the read/write unit is activated for reading or writing data, and the
20 interface means (2,3) is being initially moved for identifying data.

29. A protective device as claimed in any preceding claim characterised in that the carrier means (5) is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means (6) is provided for protecting a read
25 and/or write head forming the interface means (2,3) of the read and/or write unit.

30. A protective device as claimed in Claim 29 characterised in that the protecting means (6) cleans the read and/or write head (2,3) of the disc drive read and/or write unit as the read and/or write head (2,3) is being initially moved for
30 identifying data.

31. A protective device as claimed in Claim 30 characterised in that the protecting means (6) cleans the read and/or write head of the disc drive read and/or

write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means (5) into and out of the protecting means (6).

32. A protective device as claimed in any of Claims 29 to 31 characterised in that
5 the protecting means (6) is for protecting a read and/or write head provided by an optical head (2,3).

33. A protective device as claimed in Claim 32 characterised in that the
10 protecting means (6) is for engaging a lens (3) of the read and/or write optical head (2).

34. A protective device as claimed in any of Claims 29 to 31 characterised in that
the protecting means (6) is for protecting a read and/or write head provided by a
magnetic head (2,3).

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35. A method for protecting an interface means (2,3) of the type hereinbefore
defined of a read and/or write unit of the type hereinbefore defined in which the read
and/or write unit comprises a receiving area for receiving a data carrier, and the
interface means (2,3) is located in or adjacent the receiving area, the method
20 comprising the steps of inserting a carrier means (5) having a protecting means (6)
mounted thereon into the receiving area of the read and/or write unit, and engaging
the protecting means (6) with the interface means (2,3) when the carrier means (5) is
engaged in the receiving area for protecting the interface means (2,3).

25 36. A method as claimed in Claim 35 characterised in that the protecting means
(6) protects the interface means (2,3) from dirt and/or dust.

37. A method as claimed in Claim 35 or 36 characterised in that the protecting
means (6) protects the interface means (2,3) from shock.

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38. A method as claimed in any of Claims 35 to 37 characterised in that the
protecting means (6) cleans the interface means (2,3) as the carrier means (5) is
being inserted into the receiving area.

39. A method as claimed in any of Claims 35 to 38 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) has been activated to identify data.

5

40. A method as claimed in any of Claims 35 to 39 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) is being initially moved perpendicularly relative to the carrier means (5) into and out of the protecting means (6) for identifying data.

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41. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means (5) of the protective device (1,20,30) as claimed in any of Claims 1 to 34 into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is inserted in the receiving area for protecting the interface means (2,3).

20

42. A method as claimed in Claim 41 characterised in that the read and/or write unit is a disc drive read and/or write unit, and the interface means (2,3) is a read and/or write head.

25 43. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is an optical head (2).

44. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is a magnetic head.

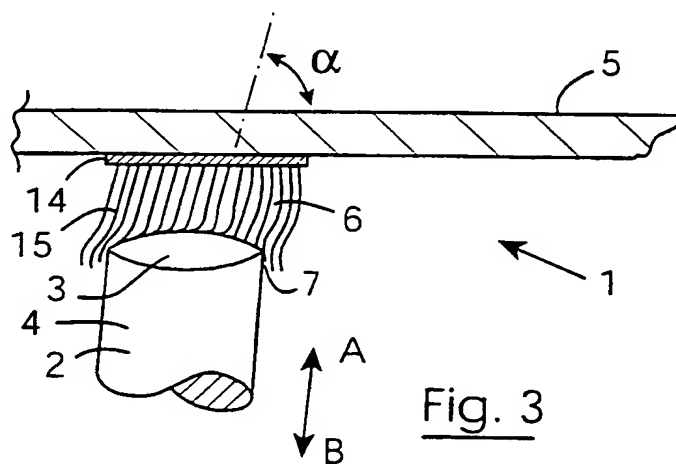
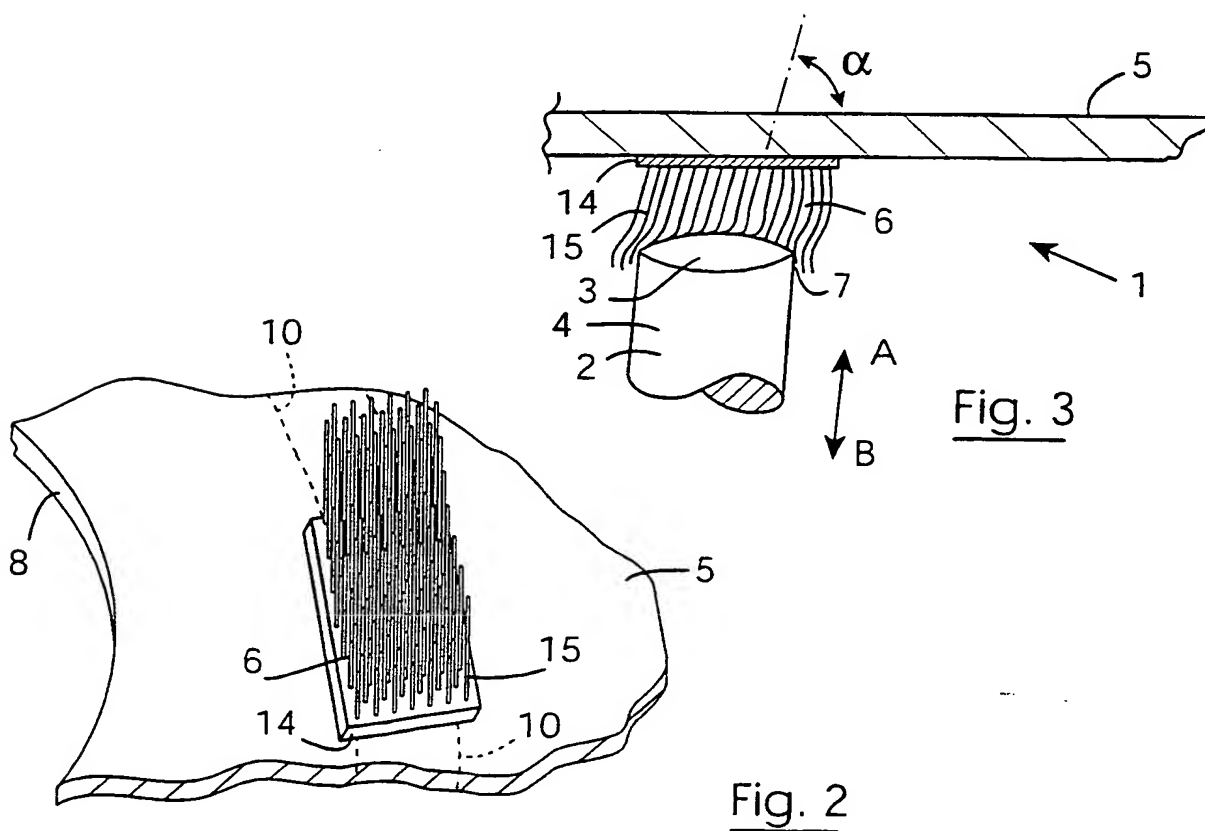
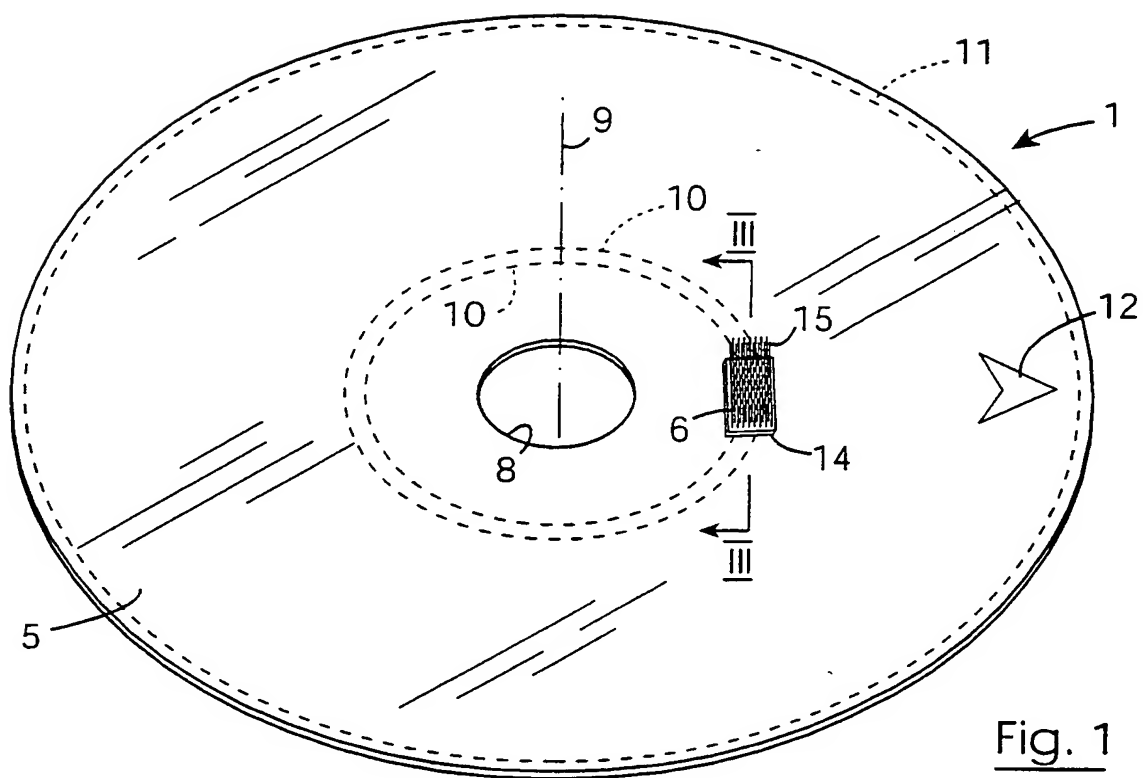
30

45. A method as claimed in any of Claims 41 to 44 characterised in that the method further comprises activating the read and/or write unit for causing the interface means (2,3) to cycle perpendicularly relative to a plane defined by the

carrier means (5) for cycling the interface means into and out of the protecting means (6) for cleaning the interface means (2,3).

46. A cleaning device for protecting an interface means (2,3) of the type
5 hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the cleaning device (1,20,30) comprises a carrier means (5) for engaging in
10 the receiving area of the read and/or write unit, and a cleaning means (6) carried on the carrier means (5) for alignment with the interface means (2,3) when the carrier means (5) is located in the receiving area so that movement of the interface means (2,3) when the read and/or write unit is activated for identifying data the interface means (2,3) is moved into and out of the cleaning means (6) for cleaning the
15 interface means (2,3).

47. A method for cleaning an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the
20 interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5) having a cleaning means (6) mounted thereon into the receiving area of the read and/or write unit with the cleaning means (6) aligned with the interface means (2,3) when the carrier means (5) is engaged in the receiving area, and activating the read and/or write unit for
25 causing the interface means (2,3) to move relative into and out of the cleaning means (6) for identifying data for cleaning the interface means (2,3).



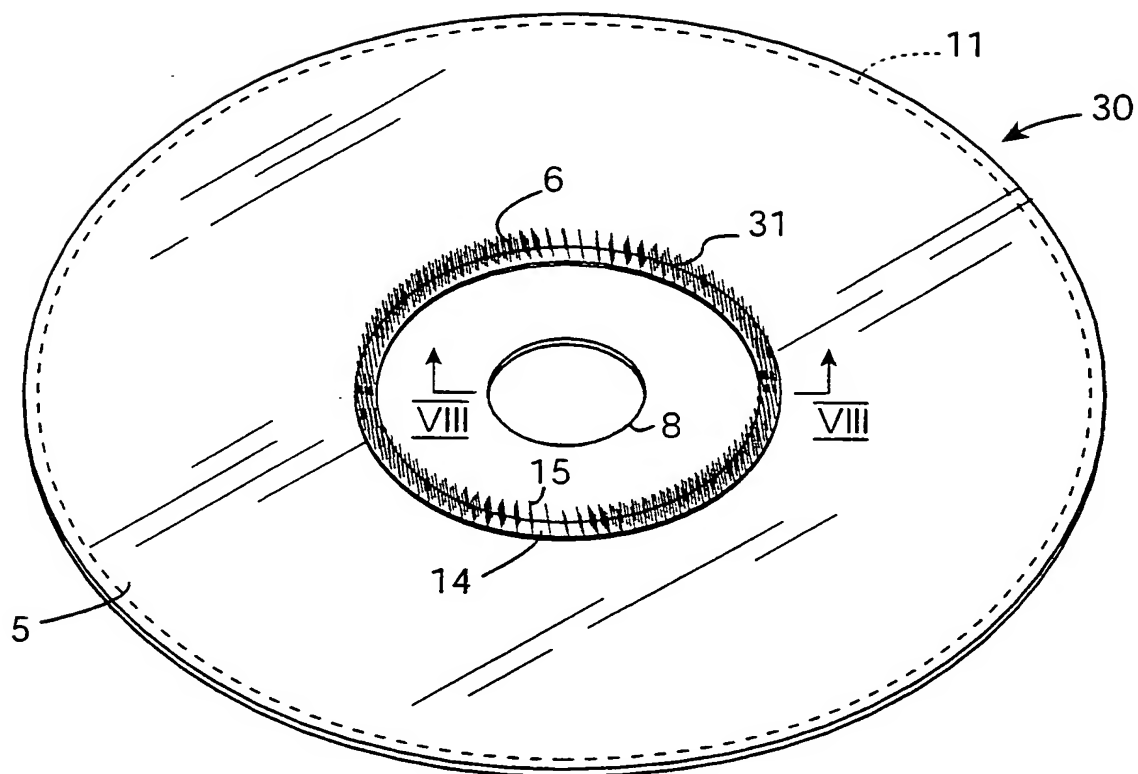


Fig. 7

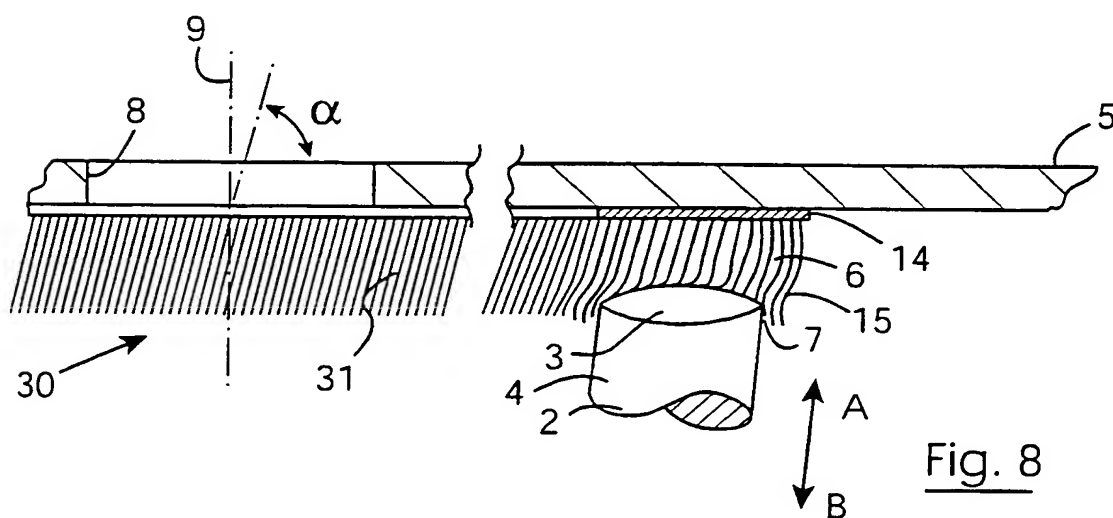


Fig. 8

INTERNATIONAL SEARCH REPORT

Intern: Application No

PCT/IE 00/00084

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11B7/12 G11B33/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	column 3, line 26 -column 4, line 13; figures 1-4	16,17
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

13 October 2000

Date of mailing of the international search report

24/10/2000

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INTERNATIONAL SEARCH REPORT

Intern. Application No.

PCT/IE 00/00084

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Intern: Application No

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